WAGENINGEN UR
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Development of methodology to assess atmospheric deposition on surface waters

Theme: Water framework directive

BO-06-006-004

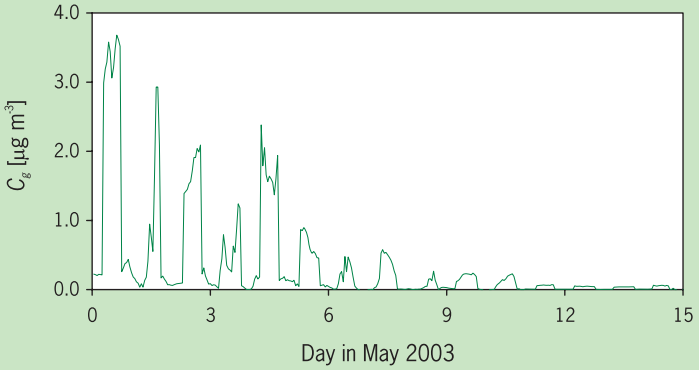
Problem

For the assessment of the risk to exposure of aquatic organisms to pesticides, all relevant pathways of pesticide inputs need to be considered. Until now, pesticide loadings due to atmospheric deposition have not been taken into account.

Approach

A conceptual tool is being developed with which the atmospheric deposition on surface waters at the local and regional scales can be quantified. A stepped approach is proposed for this purpose, consisting of estimating as a function of time:

- Source-strength using the PEARL model to calculate the volatilization from plant or soil surfaces after application of pesticides
- Concentration above the water surface using the OPS model to calculate the transport of pesticides via the air
- Gaseous deposition onto water bodies in a post-processing step



The gaseous concentration at 1 m above the ditch at 1,5 m from the edge of the field, computed with OPS.

Emission during spraying of a potato crop.

Results

Example calculations were done with the methodology described above.

- Both emission rates and the concentrations in air at 50 m from the edge of the field show a strong diurnal cycle
- The post-processing step is flexible, so different approaches to calculate deposition rates can be used
- Revolatilisation from pesticide deposit can be assessed as well. The extent depends on various factors, e.g. the characteristic of the surface water system

Future use in risk assessment

The conceptual tool can be used as a basis in the development of a procedure to include atmospheric deposition in the risk assessment for aquatic organisms to pesticides.

Communication 2008

The proposed tool will be presented in the Dutch Working Group 'Exposure Aquatic Organisms' in autumn 2008.

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This project is part of the BO research programme Plant Health of the Ministry of Agriculture, Nature and Food Quality